

NORTHEAST PLANT MATTERS

A REGIONAL DIGEST FROM THE NRCS PLANT MATERIALS PROGRAM

Issue 2, Summer 2015

In This Issue

New Cover Crop Adaptability Trial

Why Managing Compaction is So Hard

Evaluation: Spent Bentonite Drilling Mud as a Soil Amendment

Seeding Cover Crops after Cereal Grains?

Training, Outreach & Educational Activities

Cover Crop Adaptability Trial

Cover crops improve soil health and are selected for specific attributes. For example, leguminous cover crops such as clover, vetch, and peas fix nitrogen which can then be used by a subsequent commodity crop. Small grains such as oats and cereal rye are effective at nitrogen uptake, thus preventing nitrate from leaching through the soil. Radishes produce long slender tubers which loosen the soil to help alleviate soil compaction. This fall, all 4 Plant Materials Centers in our region will be participating in a national cover crop adaptability trial. Replicated and demonstration plots will be installed to evaluate growth characteristics and production attributes of commercially available varieties/cultivars of 8 core species of cover crops (Table 1).

This study will provide cover crop adaptation and growth data for the Mid-Atlantic and Northeast regions. Over the course of two years, canopy cover, spring green up, bloom period in legumes and forbs, growth stage in small grains, plant height, and disease and insect resistance data will be collected at all four PMCs. In addition, germination, vigor, winter hardiness, biomass, and nitrogen content data will be collected at both the Maryland and New York Plant Materials Centers. Throughout the study, we plan on having field days to show people the variability between the varieties/cultivars of each of the 8 core species planted and to discuss the results.

Table 1. List of Core Cover Crop Species and Type of Trial at each Plant Materials Center

Core Species	Maryland and New York	New Jersey and West Virginia
crimson, red, and balansa clovers, hairy vetch, Austrian winter pea, daikon radish, black oats, cereal rye	Replicated Plots	Demonstration Plots

For more information, contact any NE region PMC!



Shawn Belt weighs radish seed in preparation for planting to alleviate compaction; a bare ground lot will convert to trees under Maryland's CREP program at a cattle farm in Harford County, MD. More details on this study will follow!

Why Managing Compaction is So Hard: A Meditation on Deep Ripping

Extreme weather variability, loss of soil carbon, and increases in equipment size combine to form or exacerbate compaction issues in many fields. Once established, soil compaction is not easy to alleviate. Most often farmers and natural resource managers will try to fix compaction or ruts in a field through deep tillage with a disk chisel, subsoiler (disk ripper), or ripper. This method of soil management penetrates soil below normal tillage depths and breaks up compacted layers, temporary “fluffs” it, and increases water infiltration without inverting the soil. The problem is, there are many factors that effect soil compaction, and subsoiling does not correct them all. In fact in some instances, if the ripper is used incorrectly it can increase compaction, not alleviate it.



There are positive and negative consequences to deep tillage with a subsoiler even when managed correctly; so it is important to use this management tool only after careful consideration. A few key factors to consider before subsoiling are:

- 1) type of soil
- 2) depth, size, and angle of the shank
- 3) equipment size and speed
- 4) number of passes per field
- 5) number of subsoiling events per year

These factors and their influence on soil compaction are described in greater detail in a new article which has been posted on the New Jersey PMC website- simply click the image above for the full story!

For more information, contact: NJPMC, (609) 465-5901

Evaluation: Spent Bentonite Drilling Mud as a Soil Amendment

Natural gas exploration activities in the Marcellus shale geologic formation in Pennsylvania, West Virginia and surrounding states have experienced exponential growth. This recent increase in exploration and production has led to a corresponding increase in the installation of gathering, transmission, and distribution infrastructure, principally underground pipelines. Horizontal directional drilling (HDD) enables installation of underground pipelines without the need for open-cut trenches and disturbance of ecologically sensitive areas (streams, wetlands). It also avoids disrupting commerce on heavily used infrastructure (highways, airports, rail lines). HDD operations use large volumes of water-based sodium-bentonite slurry, resulting in generation of large amounts of spent mud in need of proper disposal.

Federal and state regulatory agencies have recognized the spent mud as ‘co-product’ suitable for land applications. As HDD operators are attempting to contract with local farmers and landowners to apply the spent mud on their farmlands, the latter are seeking guidance from federal and state conservation agencies for best management practices for its use as soil amendment. Yet, little is known about the effect of spent bentonite on soil quality and productivity. Soil physical, chemical, and hydrological properties can be adversely affected by high salinity, elevated levels of sodium and smectite clay minerals, and from the potential introduction of contaminants such as heavy metals. The Appalachian Plant Materials Center in Alderson, WV is collaborating with Pennsylvania and West Virginia NRCS, and West Virginia State University (1890 Land Grant Institution) to evaluate the spent material, its effect on soil quality, and to develop recommendations and best management practices for its use as a soil amendment. A new poster outlining initial results and preliminary findings can be found on the WVPMC website - [just click here!](#)

For more information, contact WVPMC, (304) 445-3005

Seeding Cover Crops after Cereal Grains? Here are a Few Equations to Help You

NRCS recommends seeding rates on a pure live seed (PLS) basis. Please [click here](#) for more information on calculating PLS from the ID PMC.

TO CALCULATE # OF SEEDS IN A SQUARE FOOT (43,560 square feet in 1 acre):

- Step 1. Target seeding rate (PLS) * # of seeds/lb = # seeds/acre
Step 2. # of seeds per acre ÷ 43,560 square ft = # of seeds per square foot

EXAMPLE:

You are seeding red clover into wheat stubble and would like to seed it at 10 lbs/ acre. To get a better understanding, it is helpful comprehend how much clover will be in a square foot.

$$10 \text{ lb/A} * 250,000 \text{ seeds/lb} = 2,500,000 \text{ seeds/acre}$$
$$2,500,000 \text{ seeds/acre} \div 43,560 \text{ ft}^2 = 57.39 \text{ seeds/ ft}^2 \text{ (PLS)}$$

What if you actually wanted 65 seeds/ft² (PLS)? Perform the following equations:

- Step 1. Target seeds/ft² (PLS) * area to be seeded (expressed in square feet) = # of seeds in your area
Step 2. # of seeds in your area ÷ # of seeds/lb = lbs needed to seed (PLS)

EXAMPLE:

$$65 \text{ seeds/ft}^2 * 43,560 \text{ ft}^2 = 2,831,400 \text{ seeds/A}$$
$$2,831,400 \div 250,000 = 11.32 \text{ lbs/acre (PLS) to seed to reach 65 seeds/ft}^2$$

To calculate # of seeds per lb:

- Step 1. Count out 100 seeds and then weigh (grams)
Step 2. 100 seeds * 453.59 (grams in 1 lb.) ÷ grams in 100 seeds = # of seeds per pound

EXAMPLE:

You counted out 100 seeds of red clover and found there to be 0.18 grams.
 $100 \text{ seeds} * 453.59 \div 0.18 \text{ grams in 100 seeds} = 251,994 \text{ seeds per lb}$

It is recommended that you repeat the above procedure 3 times and take the average to get number of seeds per pound for your seed lot.

Turn the page for a listing of seeds per pound for some of the most commonly used cover crops!



NUMBER OF SEEDS PER POUND FOR SOME COMMONLY USED COVER CROPS

Species	# of seeds per lb*	Species	# of seeds per lb*
GRASSES/GRAINS		LEGUMES	
annual ryegrass	162,577	arrowleaf clover	503,989
AROOSTOOK cereal rye	18,000	AU EARLY COVER hairy vetch	18,900
oats	15,000	Austrian winter pea	4,124
perennial ryegrass	210,972	balansa clover	647,986
triticale	15,000	berseem clover	161,996
wheat	16,000	CAHABA white vetch	9,257
WARM SEASON GRASSES		cowpea	3,780
<i>brown-top millet</i>	<i>133,409</i>	DIXIE crimson clover	181,436
<i>dwarf BMR millet</i>	<i>259,194</i>	Ladino white clover	503,989
German foxtail millet	216,511	LANA hairy vetch	11,020
<i>japanese millet</i>	<i>120,957</i>	Persian clover	566,988
pearl millet	53,364	red clover	250,602
<i>PIPER sudangrass</i>	<i>32,399</i>	REGEN alfalfa	58,908
PIPER sudangrass	42,392	sweet blue lupin	3,024
<i>proso millet</i>	<i>96,509</i>	WINDHAM winter pea	2,846
QUICK COVER <i>s x s</i> (AS5201)	22,680	yellow blossom sweet clover	237,482
RED MILO <i>dwarf sorghum</i>	20,618	BRASSICAS & RADISHES	
<i>sorghum x sudangrass</i> (AS6402)	<i>14,632</i>	BARKANT turnip	133,409
Teff	1,814,360	BARSICA oilseed radish	120,957
TRUDAN-8 <i>sudangrass</i>	26,372	Brassica rapa	207,119
		DWARF ESSEX	133,409

* different varieties and even lots of seed vary in the number of seeds in 1 lb. The above values were obtained from the USDA ARS Germplasm Resources Information network (GRIN), or actual counting (italics from actual counts)

Training, Outreach, and Educational Opportunities



United States Department of Agriculture



Cape May Plant Materials Center Natural Resources Conservation Service

50TH

ANNIVERSARY

Friday, Sept 11, 2015

10:00 am-3:00 pm

Please join us at the Cape May Plant Materials Center for our celebration ceremony and the catered lunch that follows. Enjoy the exhibits and conservation plant garden displays that highlight some of the important natural resource issues we are addressing.

To honor those lost in the terror attacks on September 11, 2001, a uniformed color guard will be on hand to open the ceremony.

It's a
celebration!
You are invited!

USDA-NRCS appreciates all those who have worked with us to protect and enhance our fragile coastal ecosystem, critical wildlife habitats and conservation farming practices.

In cooperation with the
Cape Atlantic
Conservation District



RSVP to the District
office by Aug 28
to reserve your meal.
(609) 625-3144

FOR MORE INFORMATION

CAPE MAY PLANT
MATERIALS CENTER
1536 Route 9 North
Cape May Court House, NJ

Telephone: 609-465-5901 x 102



Pollinator Conservation Short Course

USDA Natural Resources Conservation Service
Big Flats Plant Materials Center

Corning, New York
Thursday, August 27, 2015
9:00 am - 3:30 pm EST

Learn how to attract native pollinators to fields, farms, and orchards!

The USDA NRCS Big Flats Plant Materials Center and Xerces Society are pleased to announce an upcoming Pollinator Conservation Short Course in the New York Finger Lakes.

This full-day training will provide you with the latest science-based approaches to increasing pollinator populations for improved pollination and crop production. Leave with the tools necessary to assess, create, protect, and manage habitat for these vital insects!

The content of this course is tailored to the needs of farmers, NRCS, SWCD, Cooperative Extension, and state department of agriculture employees, as well as crop consultants, natural resource specialists, and non-governmental conservation staff.

Details and Registration:

[Click here for details, including the agenda.](#)

[Click Here to Register Now- Registration is free, but space is limited!](#)

Cover Crop Workshop for Small Scale/Organic Vegetable Growers and Grain Producers

Big Flats Plant Materials Center
10/16/15 9:30 am – 3:30 pm

Matt Ryan – Cornell University, School of Integrative Plant Science, Soil and Crop Section, Assistant Professor; and **Jeff Liebert** Graduate Student; Rolled Cover Crop, Organic No-till Soybean in NY.

Anu Rangarajan- Hudson Valley Farm Hub, Director; Multiple Strategies to Reduce Tillage on Diversified Vegetable Farms.

Brian Caldwell- Cornell University, School of Integrative Plant Science, Soil & Crop Sciences section, Research Support Specialist; Planting Windows to get the Most Out of Your Cover Crops.

Emily Reiss- Cornell University, School of Integrative Plant Science, Horticulture Section, Graduate Student; Diversity of Species and Cultivars in Cover Crop mixtures: Benefits and Implications for Management.

Tour of Cover Crop Demonstration Plots: **Paul Salon**, (NRCS, Plant Materials Specialist), **Dave Wilson** (King's Agriseeds, Research Agronomist) **Brian Caldwell**- Cornell University; Cover crop demonstration with over 250 plots (species, varieties or mixes) seeded at several dates.

Reduced Tillage Demonstration: **Anu Rangarajan** (Hudson Valley Farm Hub); and Soybeans Planted into Rolled Rye Demonstration, **Matt Ryan** and **Jeff Liebert** (Cornell University).

CCA credits available, Lunch available for \$10.00

For additional information contact paul.salon@ny.usda.gov or by calling 607-562-8404. This is a field tour- let us know if you have special needs.

[Click here to register!](#)

